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| APPLICATION NO. | FILING DATE | FIRST NAMED INVENTOR | ATTORNEY DOCKET NO. | CONFIRMATION NO. |
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| 09 740,513 | 12/19/2000 | Kiyoto Takizawa | AK-339XX | 5149 |

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EXAMINER

KERNS, KEVIN P

| ART UNIT | PAPER NUMBER |
|----------|--------------|
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1725

DATE MAILED: 10/25/2002

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

09/740,513

Applicant(s)

TAKIZAWA ET AL.

Examiner

Kevin P. Kerns

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133).
- Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 27 August 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-7 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-7 is/are rejected.
- 7) ☒ Claim(s) 1 and 4 is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
- Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
- 11) ☐ The proposed drawing correction filed on _____ is: a) ☐ approved b) ☐ disapproved by the Examiner.
- If approved, corrected drawings are required in reply to this Office action.
- 12) ☐ The oath or declaration is objected to by the Examiner.

Priority under 35 U.S.C. §§ 119 and 120

- 13) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- * See the attached detailed Office action for a list of the certified copies not received.
- 14) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. § 119(e) (to a provisional application).
- a) ☐ The translation of the foreign language provisional application has been received.
- 15) ☐ Acknowledgment is made of a claim for domestic priority under 35 U.S.C. §§ 120 and/or 121.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☐ Information Disclosure Statement(s) (PTO 1449) Paper No(s) _____
- 4) ☐ Interview Summary (PTO-413) Paper No(s) _____
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other _____

DETAILED ACTION

Claim Objections

1. Claims 1 and 4 are objected to because of the following informalities: in claim 1, 4th line from the bottom of the claim, a comma should be added after "cylinder". In claim 4, line 14, a comma should be added after "cylinder". Appropriate correction is required.

Claim Rejections - 35 USC § 112

2. The following is a quotation of the second paragraph of 35 U.S.C. 112:

The specification shall conclude with one or more claims particularly pointing out and distinctly claiming the subject matter which the applicant regards as his invention.

3. Claims 4, 6, and 7 are rejected under 35 U.S.C. 112, second paragraph, as being indefinite for failing to particularly point out and distinctly claim the subject matter which applicant regards as the invention.

The term "required" in claim 4 (line 9) is an unclear term which renders the claim indefinite. It is unclear what spaced interval is "required" between the hydraulic cylinder and the melting cylinder.

The term "to moldings" in claim 6 (line 7) is an unclear term which renders the claim indefinite. It appears as though the nozzle member is attachable to the mold, not directly "to moldings" within such a mold.

Claim Rejections - 35 USC § 103

4. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

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(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made

5. The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148

USPQ 459 (1966), that are applied for establishing a background for determining

obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 1-7 are rejected under 35 U.S.C. 103(a) as being unpatentable over Wang et al. (US 5,501,266) in view of Asuke (US 5,865,240), and further in view of Kono (US 5,983,976).

Wang et al. disclose a method and apparatus for injection molding of metallic materials, in which an in-line vertically inclined single heating cylinder chamber (barrel

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19 with associated heating coils 25) houses an axially rotatable injection screw 18, and further has a nozzle/plunger tip portion 28 (of substantially the same diameter of that of the front chamber, thus producing a sliding clearance within the chamber) that mates with a sprue bush (indicated by mating diagonal lines in Figure 4) in a complementary manner (abstract; column 5, lines 8-30; column 6, lines 40-67; column 7, lines 1-20; and Figures 3 and 4). The apparatus is built, or suitably clamped, on a base 40 (platform), upon which the mold is also placed, and is further mounted upon a damping unit 42, that provides a unitary, axially arranged injection molding apparatus, resulting in an overall structure arranged at the same angle as the mold (at the lower end) that receives the molten metal (column 4, lines 33-50; and Figures 1, 2, and 4). A hopper 1 serves as the metal supply means (column 4, lines 51-52; and Figures 1 and 3). The shaft of the screw is connected to a motor 9 which rotates the screw (in a forward position for injecting the molten metal), and also permits the screw shaft to slide up and down freely, the retraction of which would be due to the back pressure (negative pressure) applied by the molten metal (flowing under self weight) that is accumulated near the screw tip (periphery of screw head portion) around the injection area, or mold inflow opening 32 (column 4, lines 57-67; column 5, lines 31-34; and Figures 2-4). Wang et al. do not disclose the hollow shaft (of a concentric arrangement) with an agitating member with agitating wings and the oblique orientation of the melting cylinder.

However, Asuke discloses a rheocasting method and apparatus, in which an outer cylinder 24 contains an auger/screw (with a diameter substantially the same as

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the outer cylinder) having a hollow shaft 16 contains an agitating member (stirrer 14) with agitating wings, or stirrer blade 18 (abstract; column 1, lines 21-60; column 2, lines 3-67; column 3, lines 1-23; and Figures 1 and 2). The (concentric) hollow shaft and agitating member (stirrer) arrangement is advantageous for drawing off a semi-solid metallic material while simultaneously stirring and adjusting the viscosity of the metallic material (column 1, lines 21-25).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the apparatus for injection molding of metallic materials, as disclosed by Wang et al., by adding the concentrically arranged hollow shaft with an interior agitating member (stirrer) with agitating wings, as taught by Asuke, in order to draw off a semi-solid metallic material while simultaneously stirring and adjusting the viscosity of the metallic material (Asuke; column 1, lines 21-25).

Wang et al. (in view of Asuke) disclose/suggest the elements of claim 1 above, with the exception of an oblique orientation of the melting cylinder.

However, Kono discloses a liquid metal injection molding system that includes a feeder, a desired (metered) amount of liquid metal flowing in an inclined chamber, a plunger (ram) within a heated barrel, or chamber, and a piston that creates a negative pressure in the chamber (abstract; column 2, lines 59-67; column 3, lines 1-34; and Figures 1, 2, 8, and 10-12). The feature of injecting molten metal in a liquid state at an inclined angle throughout the system is advantageous for the purpose of obtaining

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precise control of injection volume, reduction of injection cycle time, and reduced porosity of metal products (column 2, lines 23-40; and column 3, lines 9-34).

It would have been obvious to one of ordinary skill in the art at the time the applicants' invention was made to modify the injection molding method and apparatus disclosed by Wang et al., by adding the concentrically arranged hollow shaft with an interior agitating member (stirrer) with agitating wings, as taught by Asuke, in order to draw off a semi-solid metallic material while simultaneously stirring and adjusting the viscosity of the metallic material (Asuke; column 1, lines 21-25), and by further using injection of molten metal in a liquid state at an inclined angle, as taught by Kono, in order to obtain precise control of the injection volume, to reduce the injection cycle time, and to reduce porosity of metal products (Kono; column 2, lines 23-40; and column 3, lines 9-34).

Response to Arguments

8. The examiner acknowledges the applicants' amendment after final (paper #11) and request for continued examination (paper #13), received by the USPTO on July 29, 2002, and August 27, 2002, respectively. Claims 1-7 remain under consideration in the application.

9. Applicant's arguments with respect to claims 1-7 have been considered but are moot in view of the new ground(s) of rejection.

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Conclusion

10. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Kevin P. Kerns whose telephone number is (703) 305-3472. The examiner can normally be reached on Monday-Friday from 8:00am-5:00pm.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Tom Dunn can be reached on (703) 308-3318. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 305-7718 for regular communications and (703) 305-6078 for After Final communications.

Any inquiry of a general nature or relating to the status of this application or proceeding should be directed to the receptionist whose telephone number is (703) 308-0661.

KPK
kpk
October 11, 2002


KEVIN P. KERNS
PRINCIPAL EXAMINER